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ABSTRACT

As technology has developed, there has been a growing emphasis on using computer college search programs within the process of counseling students about college. This is one part of a trend in which school counselors are integrating technology into the counseling process. The questions may be asked how this technology is impacting the roles and practices of school counselors, and how effective it is for students. This qualitative study examines the task of completing a computer college search. A basic understanding of the complex search program involved is provided with a sense of the logic and pathways available. The study was conducted with 12 students and 2 counselors participating at a suburban high school. Each student completed a questionnaire about their computer experience and family background. Students were observed under two conditions: (1) "Alone," working alone on a computer; and (2) "With Counselor," working on a computer with a counselor. Results are presented and discussed under "Navigation within the Program," "Problem Solving Strategies," "Counselor/Student Interaction," "Interpretation of Selection Factors," and "Fitting into the Bigger Picture of the Process." The uses of computer college searches within counseling and the nature of the counselor's role are discussed. The demographic survey form is appended. (EMK)

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Student Use of College Computer Searches - A Qualitative Comparison of Independent Usage and Usage With a School Counselor

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Introduction

Among the American School Counseling Association "National Standards For School Counseling Programs" (Campbell and Dahir, 1997) are the following Academic standards. "Students will complete school with the academic preparation essential to choose from a wide range of substantial post-secondary options including college" which contains a specific goal of "identify post-secondary options consistent with interests, achievement, aptitude and abilities" (p.21). Another standard is the statement that "The school counseling program enables all students to acquire the skills to investigate the world of work in relation to knowledge of self and to make informed career decisions" (p.23). Additional goals and competencies within the Career Development Standards include: "apply decision making skills to career planning, course selection and career transitions", "use research and information resources to obtain career information" (p.24), "identify personal preferences and interests which influence career choices and success" (p.25). For approximately 50 % of our high school students, their career decision involves a decision including college attendance.

According to the "Secondary School Counselor Survey" (Miller, 1998), 92 % of high school counselors report that college counseling is one of their four most time consuming duties. College Counseling was ranked number two in importance behind personal counseling (Miller, 1998). Computer college searches are becoming more and more popular. At a recent National Association for College Admission Counselors conference, there were at least eight companies selling computer programs in the

exhibition area for use in schools, and there are more available on the web. These have all been developed in the past fifteen years. According to the previously mentioned Counselor Survey, 89 % report they have access to college search software in their schools. Within the past decade, much of the emphasis in college counseling within school counseling offices have included using the computer search programs within the process.

As these programs (as well as similar programs designed to help students identify career possibilities) burgeon into the marketplace, the role of the counselor in the process is shifting. This is one piece of a general trend in which school counselors are integrating technology into the counseling process. My general interest is this integration and how it is impacting our roles and practices as counselors. This study is a beginning point for examining that bigger issue. I am examining one particular task in which this integration takes place; the task of completing a computer college search.

As school counselors, we decide whether to purchase these computer programs for our offices. If we do purchase them, we then decide whether our students complete these searches on their own or how we work with them in the process. Each of these alternatives are connected to various implications and assumptions effecting both the counselor and the student. I could find no literature with previous studies regarding the use of these programs within counseling offices, or of student perspectives on their effectiveness. One text designed for school counselors working on the college selection process includes a six page chapter on Using Technology to Select a College. It does refer to selecting programs which are appropriate to your clientele, compatible with your beliefs about decision making, and awareness about the time and ethical implications of

students using the program alone or with a counselor. General recommendations from this text include continued counselor involvement rather than student use alone. Specific concerns include ethical issues of students assuming the validity of computer-generated data, and providing an avenue to correct other misperceptions or problems (Johnson, C.S., Cash, R., & Mathay, E.R., 1995). If indeed a vast majority of counselors are using these programs in their offices, I believe this warrants looking closer at the effect these programs have on practice.

There is some research on the use of computer-assisted career guidance systems (CACGS). The CACGS programs hold some similarities to the college search programs. They are both designed with a variety of options which a user selects to include in a search to find a list of careers/colleges which satisfy the qualities included. The recommendations in these research articles refer to the support that a counselor can provide in the process. They warn about the idea of computer-generated information being considered infallible. By being familiar with the CACGS computer program systems, counselors will hopefully be able to identify when or which users should be encouraged to use the program, review the results to learn the client's decision making style, and help with interpreting the results (Gati, 1994). Additional recommendations include helping the client with identifying the priorities of the characteristics available so that the search process will be more valuable to the client (Gati, Garty, and Fassa, 1996), and helping with finding compromises within the characteristics they are considering (Gati, Shenhav, and Givon, 1993). In these articles, although they referred to advantages of using the programs with a counselor rather than alone, there were no studies which identified differences in these usages. The process of career selection and college

selection hold many similarities. Clients are encouraged to think about their own personalities and preferences and match those to what they are able to learn about the environment of a college or career. While there are some similarities, there are significant differences which warrant separate research and practice.

Due to the importance that high school counselors place on their role in college counseling and the dearth of research on this function, I designed the following study to answer these questions. My main research question is: How does a student go about the computer college search process similarly and differently when using the program alone and with a counselor? Imbedded in this question are specific questions regarding: which criteria/factors does a student include in the search and do they change with the presence of a counselor? How is the veracity of the information perceived? How are the choices presented by the program understood by the student? How is the search process undertaken and related to the larger process of college selection? How is the student approach to the program different from the counselor approach as it relates to problem solving? As we continue into the computer age and utilize programs within our offices, I believe we need to simultaneously understand the ways in which the programs might be changing our understandings and practices regarding college selection counseling.

The Computer Search Program

In order to understand this study, the reader must have at least a basic understanding of the complexity of the search program involved. While the 'logic' of the program is similar to all search engines, the number of factors included is formidable. I

use the term ***selection factor*** (italicized and bold) for the options presented to a user to include in the search. I use the term **pathway criteria** to indicate the sequence which a user has to go through to get to a selection factor. I use the term **layer** to refer to how far away a user is from the main menu, which is the first layer. I use capital letters for the factor or criteria which are presented in the program. As an example, if a user wanted to select ***MIDWEST*** as a selection factor, the pathway criteria which lead to this selection are: COLLEGE CHARACTER > LOCATION > REGION. Each of these last three options lead to other pathway criteria as well as the one chosen. For example, at LOCATION, there are two pathways, one to REGION, one to SETTING. A selection does not enter the actual search file until the user reaches the end of the pathway and chooses one selection factor, in this case ***MIDWEST***. When the user indicates MIDWEST, this would be at the fourth layer of the program. If the user were to choose a specific state in the Midwest, for example ***OHIO***, this would be the fifth layer.

On the main screen of the search program are six icons from which a user can start a search. They are organized with two rows of three general criteria. On the top row from left to right are COLLEGE CHARACTER, ACADEMIC PROGRAMS AND MAJORS, and ADMISSION AND APPLICATION INFORMATION. On the second row are, from left to right FINANCIAL INFORMATION, SPECIAL SERVICES, and COMPARATIVE STUDENT DATA. These six criteria make up the first layer of the program. If a user chose to follow the COLLEGE CHARACTER pathway by clicking on that icon, the next screen has seven criteria. This second layer consists of LOCATION, PUBLIC/PRIVATE, TYPE OF INSTITUTION, STUDENT BODY, CAMPUS LIFE, HOUSING OPTIONS, and SPORTS. Within each of these pathways a choice might lead

to yet another layer, as we saw in LOCATION, or directly to selection factors. Five layers is the maximum. In order to go up one layer, toward the main menu of first layer criteria, there is a GO BACK button on the screen. (See Table 1 for a sample of the program. This presents some of the options to understand how the program is nested, not to introduce all the various options.)

On many of the screens when a user is at a level of choosing a selection factor to be included in the search, there is also an option of indicting ANY or ALL. This choice follows the Boolean logic used in most search engines but which is frequently found to be intimidating to users (Landauer, 1995). For example, in the pathway criteria of MAJORS, the user might select ***ARCHITECTURE, CIVIL ENGINEERING***, and ***PSYCHOLOGY***. If a user selects the ANY choice, the search would look for colleges which have **either** of the three majors selected, and a college left in the pool might have Psychology but not Architecture or Civil Engineering. If the user selects the ALL choice, the search would look for colleges which have all three of those majors, and all colleges left in the pool would have Architecture, Civil Engineering and Psychology.

In the Tool Bar across the top of the screen, there is Quick Find and Tell Me. Quick Find includes all of the selection criteria in alphabetical order. Tell Me offers information relevant to the screen options.

On the screens which offer selection factors, there is also a WHY NOT button. When this is clicked, all of the college names included in the program come up on the screen. When the user chooses one college name, the next screen indicates which of the factors included in the search at that point are responsible for that college NOT being included in the pool. For example, if my selected factors included colleges of the size

5,000 - 10,000 and I used the WHY NOT to find out why Michigan State University was not in my pool of colleges, it would tell me that it does not meet that size criteria. I then know that it does include all other factors I have selected in my search.

A student can look at a profile of information about a specific college by double clicking on the college name. The profile gives statistical information about the college.

This describes specifically the Peterson's College Quest program, which is the program used in the school studied. It is typical in its approach and complexity to most of the other programs I have seen or used. While there were some problematic areas which might be specific to this program, I do not believe that any of them are perfect and am not intending that this study be about this particular program, but generalizable to computer college search programs.

Methods

Participants

"Suburbia" High School, located outside a large city in the Midwest, enrolls approximately 800 students in four grades. Over 90% of the students attend college. ACT scores, taken by 80% of the students, have averaged at least threes points higher than the national average for the past four years. SAT scores, taken by 87% of the students, have averaged 60 points above the national average for both Math and Verbal scores. The school is well supported by the community, which has consistently passed bond issues for school improvement. They have been identified both as an Exemplary School and a Blue Ribbon School. They are the school district in the region to which others compare themselves.

This study was conducted between January and June, 1998. The Suburbia guidance office has a college resource room which houses file cabinets and book shelves filled with information about post-secondary options, as well as a computer for student use with the Peterson's College Quest program installed. All the searches and interviews took place in this college resource room.

The junior class counselor, "June" was asked to select twenty four students from her class list who would be representative of the class academically and socially. I contacted sixteen of these students to distribute permission slips and describe the study, twelve returned the permission slips. The sixteen originally contacted were selected based on the time of day I was there and the proximity of the student to the counseling center at that time, which is somewhat random as I contacted students at three different times of day. I did not contact the remaining students since twelve was my target. Eight of the participants were female, four were male. All of the students were Caucasian.

In March it became clear that the time involvement for June to participate with all twelve students would be difficult to arrange, so the senior class counselor, "Alan" agreed to work with the study as well. June has been a high school counselor for seven years, three of which are at Suburbia. Alan has been a high school counselor for sixteen years, six of which are at Suburbia.

Procedure

Each student completed a survey with questions about their previous history of using a computer college search, their comfort level with computers, their confidence level with the counseling staff, and their family background with college attendance (Appendix). They were then asked to conduct two computer searches, one (Alone) on

their own and one (With Counselor) with the support of the school counselor. Seven of the students conducted their Alone search first, five conducted their With Counselor search first. One of the students was absent on the last day of the study when her second (With Counselor) search was scheduled, so she did not complete the full process. During one of the scheduled With Counselor searches, neither counselor was available so with the student's permission I acted as his counselor for that search. During another With Counselor search the scheduled counselor was busy with another situation so the student started his search alone and the counselor joined in when he was available.

During the Alone search, I was in the room taking notes as well as audio taping the process. The students were asked to talk aloud during the search process, telling me what they were deciding to choose and why. Some students were hesitant about the talk aloud procedure, so I used prompting questions with these students such as: "What do you expect to be included in that criteria?" "Why did you make that choice?" or "What are you thinking?" If the students asked me questions about the program or the criteria, I would let them know I could not answer them at that point and suggested they look for something on the screen which might be helpful. During the With Counselor search I was also present, taking notes and audio taping the interaction between the student, counselor and computer.

After each search, I retained copies of printed lists of colleges and criteria included and asked the students a series of questions about the process. Most of these interviews were conducted immediately after the search, three could not stay for that amount of time and were scheduled for one or two days after the search. I was in the school one day per week, and attempted to have a one week break between each search,

but due to scheduling conflicts, students occasionally had up to a month between their two searches. If students misinterpreted aspects of the program or the process, or if they had asked me questions that I could not answer at the time, I clarified the information for them after the second interview.

Each counselor was also interviewed twice, once at the beginning of the study and once afterwards.

Analysis included transcribing the tapes of each search, writing up the pathways each student took through the search program, relating the interviews to the process, and looking at the printed lists of schools and criteria. Each tape was printed into a table in which the first column was the words of the student and/or counselor as they went through the process, the second column was what happened on the computer screen, and the third column was commentary either from myself or from the interview if the student had reflected back to a particular time of the search. Both during the process of writing these tables and after the study was completed, I noticed patterns in the data. Throughout the gathering of data and the analysis, I met with a research practicum group of five other graduate students and our sponsoring professor. We discussed ideas, problems, and developments as they arose in the course of the study.

Results

Every one of the students felt more confident in the results of their searches when performed with the support of a counselor, regardless of which one was conducted first. This stems from a variety of reasons. Counselors introduce problem solving strategies of how to approach the process which the students do not initiate on their own. Counselors utilize options in the program which the students do not find on their own. Students

report recognition that the counselor integrates knowledge of themselves personally, the program, and colleges. There are occasions when the counselors impose their own values into the process. Some of the students have difficulty with aspects of navigation within the program. Some of the factors are entered more often when the student is using the program alone. The interpretations of the selection factors themselves can be problematic. I will examine and provide examples of each one of these points.

A student would likely have some variation in two searches just by virtue of conducting a second one. Their priorities and decisions are not necessarily stable over time and they would presumably learn something about the program and the process which might carry over to the second search. I did not ask any of the students to conduct both searches alone, so I cannot factor in the 'practice effects' to the changes reported here, but I do acknowledge that they exist.

NAVIGATION WITHIN THE PROGRAM

All of the students reported that they were very comfortable using computers both for word processing and Internet access. Two also reported they were familiar with computer programming. Only one showed some hesitancy in working with the computer.

Where Do I begin?

When students started the program for their Alone search, they almost all started with the icon located in the upper left corner of the screen labeled COLLEGE CHARACTER. When asked about why this was their starting point, most students referred to its location on the screen. Indeed, we are trained from kindergarten to start in

the upper left corner, and research has shown that our eye movements are drawn to the upper left part of a page (Brandt, 1945). I contacted the creators of the program to find out whether this was a conscious decision on their part, and what the development process had been. I have not received a response, but knowing that this is likely where students will start is an interesting piece of information for counselors who are deciding which program to use. I think this presents an implicit philosophical choice about what students might look at first in their search, and is something to consider if we are to follow the recommendation of consistency between our decision making philosophy and the student experience.

Back to the Future

Many students got 'lost' in the program, losing track of what pathway and layer they were in. Some of the students did not seem to be considering the GO BACK button as an option for moving up layers, which is the intention of that button. These students were frequent Internet users who assumed that the GO BACK button would take them back to the screen which had immediately preceded this one, as would be the case on an Internet screen. Once they discovered its meaning they easily adapted to using it.

Any or All?

The choice presented in the program with the ANY or ALL was very confusing to many of the students. As described earlier, in the pathways where the choice would be applicable, the user has the option to search for either ANY of the factors or ALL of the factors. The default is set at ANY, so if a user does not notice or understand the choice and does not select anything here, the search will be made with ANY of the selection factors. One student in particular, "Jean" kept returning to this, trying to make sense of it

during her first search, which was conducted alone. Jean spent two hours on this search, these comments are presented in order but were from throughout her search.

> I don't see a difference between ANY and ALL...ANY is a lot more, okay so its ***ARTS, FINE ARTS*** OR ***LATIN AMERICAN STUDIES***, or its AND, so this would probably mean it has both, the other one means it has one or the other, so its all inclusive...

Even though at this point, Jean seems to understand the meaning of the choice, she kept on returning to it with additional questions and confusions.

> ....Lets try ANY instead of ALL - 1430 colleges, that's a lot. I know I am not going to go to a school based on any one field they have because chances are I will probably change my major, I don't even know what I want to do yet, ...still 1400, switch to ALL - zero- back to ANY, can't be that selective....If I added ***CHILD PSYCHOLOGY*** would that increase it or decrease it? It increases it by one, maybe that one it increased by would be one that would appeal....I wish I could click on it and since I have the OR selected it could tell me which of the specific things that college includes.... I don't think you can change the majors and sports separately, oh I guess you can, that means it would be picking a college for me that would have ALL these things and then OR. I really don't understand how that works....can I change the majors to OR and the sports to AND?

In Jean's interview, which was the following day, I asked her how she understood the ANY/ALL choice. She answered "That's the AND/OR, right? In my mathematical way of explaining it, the AND is the intersection, so the list would be the schools that would have every one of the things on the list. The OR could be one or the other... or both?" The inclusion of the term 'intersection' indicated a sophisticated understanding of the logic involved, but there was still some hesitancy and an interesting question of what happens when both factors are included. She seemed to grasp it toward the beginning of the search, but if she really understood the logic and process of the ANY choice, she would not have had to ask the question of whether an additional choice

would increase or decrease the resulting pool. A week later, in her second search, the student remarked at one point: "Let's see what would happen if I went AND, see what it does, zero. So, no one has all of those majors." This indicates that she retained her understanding of the logic involved.

Jean did more thorough processing of this issue than any other student, but they all seemed to struggle a bit with the choice. None of the students after the search alone reflected on the importance of this choice from a theoretical standpoint of wanting options, instead they saw the impact as only one of affecting the number of colleges in the pool. I asked Jean why the ANY or ALL option might be important in conducting a search. "The OR would give you a wider selection, the AND narrows it down a lot more".

The counselor introduced the concept of what impact it might have on later choices.

> Michael: "I like the ANY better than the ALL."
> Counselor: "Okay, you had talked about that you liked it because it didn't take [the numbers] down too much."
> Michael: "Yea, and I am not really, like, really decisive about what I want to do either, so, I mean, I want to do maybe ***ELECTRICAL ENGINEERING*** or ***CIVIL ENGINEERING***, I don't want just one of them."
> Counselor: "Okay. One of the possibilities, though, is if you want to have both of those options at school, that you want to look at what school has both of those. Because then you could go there and still be able to make up your mind between the two."
> Michael: "That's true."
> Counselor: "Try switching to ALL and let's just see what is there."
> Michael: "It is not a huge difference."

In the interview with the counselors after the study was completed, both June and Alan indicated that they, as well as the students, were sometimes hesitant to match the activities or majors to ALL because of the impact on the numbers of colleges in the pool.

Since the tendency is to want students to think about generalities first, and specifics later, their goal at the Junior level is to develop a 'long list'. Students then research these colleges more thoroughly to pare down later to a 'short list'. Narrowing down options by choices of activities available or majors, when we know these are very likely to change, is not inherently a comfortable counseling agenda.

Why Not?

The two students who found the WHY NOT feature on their own did not understand how to use the feature. When they were introduced to it by the counselor as a way to find out which selection factor(s) were responsible for excluding a particular college, they found it an extremely helpful and valuable tool.

Factors selected

The areas where I found differences between the Alone searches and the With Counselor searches in terms of how often they were selected were all in the College Character pathway. If one follows the pathway LOCATION > SETTING, the selection factors are ***URBAN, EASY ACCESS TO METROPOLITAN AREA, SUBURBAN, SMALL TOWN***, and ***RURAL***. Only one student in the search With Counselor chose to include any of these factors in the search, although they entered the pathway and considered them. More than one third of them selected a factor in this layer of criteria when conducting a search Alone. In interviews, one student reflected that "I probably will never leave campus but it would be nice to know that something was available if I did" Another student reflected on some college visits during which she had learned that she was less comfortable in some settings than others.

Students conducting their search Alone were also much more likely to select a factor in the pathway of COLLEGE CHARACTER > PUBLIC/PRIVATE where the selection factor choices are ***PUBLIC, PRIVATE NOT RELIGIOUSLY AFFILIATED*** or RELIGIOUS AFFILIATED with a variety of religions listed for choice of affiliation. One fourth of the students included a selection in this pathway during their Alone search, while none did in the search With Counselor.

In the COLLEGE CHARACTER > CAMPUS LIFE pathway, three students included wanting ***FRATERNITIES AND SORORITIES***, while none selected this in their search With the Counselor. Alone, half of them selected ***COLLEGE HOUSING AVAILABLE, OFF-CAMPUS ALLOWED*** in the COLLEGE CHARACTER > HOUSING OPTIONS pathway, while this showed up only once in the searches conducted With the Counselor. More also selected factors in the COLLEGE CHARACTER > SPORTS pathway during their Alone search, choosing various options for either Intramural or Interscholastic sports availability on campus. (See Table 2).

All of the other selections that were included in the searches were entered in similar amounts during the Alone searches and the With Counselor searches.

One possibility for these differences might be that the counselors in this study were less likely to encourage consideration of these factors. Another possibility is that since the students started in the College Character pathway first during their Alone search, as indicated earlier, they came upon these options early in the process and were not yet cognizant of the impact of these choices on the process. Another possibility is that the counselor helped the student to sort out their priorities and enter factors which

they consider more indicative of their needs, through interaction described below. Further research would help clarify the reasoning for these differences.

What Is Your Major?

The possibility of including the selection of a major during the search process caused problems for a number of reasons. One of these is the AND/OR issue addressed earlier. Another is the lack of knowledge that some students have about quite sophisticated choices presented. The most common questions the students tried to ask me during their Alone search were regarding finding a major or describing what was meant by a major.

Roger during his Alone search, said the following after he had made one selection from the engineering area: "And also Physics, just in case engineering isn't exactly what I want. So....I think that is under APPLIED SCIENCE" (clicks on this cluster, scrolls through). "Nope. I am trying to find it here, it might be under ENGINEERING TECHNOLOGIES" (clicks on this cluster, scrolls through). "Nope." There is a cluster labeled Physical Sciences but he does not select it. Instead he notices the EDUCATION cluster, clicks on it and scrolls through. "Actually, teaching physics is something I have considered, so that is what I will put in there. I will put in ***SECONDARY EDUCATION***." Because Roger could not find Physics, he substituted Secondary Education, which will likely have a differential impact on the colleges in his pool.

Lynn is interested in studying something connected to the environment. Later, by looking in the Quick Find alphabetical list, I found there are eight majors in this program that begin with Environmental, and they are reached through different clusters. Do we really expect a High School student to understand what the differences are between

Environmental Sciences, Environmental Studies, and Environmental Biology? As June explained to Lynn during her search:

> So, you have already printed ***ENVIRONMENTAL SCIENCE***. Click that off, and let's print the list that says ***ENVIRONMENTAL STUDIES,*** because it looks like you are getting two totally different lists. And it is just a matter of what they are calling the major that is going to be very similar.... Does that make sense? That is kind of a trick with the program, is, often times they will call a related major something just little bit different, and so the more you play with it, the more you see the similarities.

High School students are not likely to understand the intricacies of titles given to various majors. The clustering can be helpful at times to ease the anxiety of how many options one has to choose from at one time, but it was problematic on occasion as well. Only two students used the Quick Find to check the alphabetical list, one of whom used Quick Find exclusively and never went through any of the icons.

Nowhere to go

Students had differing reactions to reaching zero colleges on their list. Many simply understood that they had added something to their list that they needed to change - that they needed to "not be so picky". They figured a way to trace their steps back and found something to change.

Some however, responded with much frustration, indicating that the "computer does not like me" or that "it is not working". One student in particular did not understand the search system. She entered the MOUNTAIN location area, which shows a map of the states (Colorado, Wyoming, Utah, Montana, and Idaho) included in that geographic region. The search at the regional level showed Zero colleges, there were no colleges in the mountain region that matched her additional factors. She went through each state included in the region, however, anticipating that a college might show up in

Colorado (etc.,) which was not included in the mountain region. She repeated this in three separate geographic regions. She kept repeating "I don't understand why it worked in the Midwest but it won't work in the South". She would return to the Midwest region, where it did 'work' (she had some colleges remaining on her list) and then return to the area where it did not 'work' (where she had zero colleges), apparently believing that this would make a difference. This was the student who was absent for her second search, so I did not have a chance to discuss a learning process with her.

Another student had just entered PUBLIC COLLEGES and wanted a small, 1,000 -2,499 student college. She had selected a few other factors as well, but this combination alone brought her down to Zero, since there are no public colleges in our state that are that small.

> I am going to change my housing to ***ON CAMPUS ONLY***, still no difference, now I'll change the size, student body, enrollment size to....(looks at the options) I don't want to because that is what I want. (referring to the ***1000-2,499*** she had initially selected) I just want , I want to have something to pick from, I don't understand why I don't have anything to pick from..... Let me go back and make the student body bigger even though I don't want to make it bigger, (adds ***2,499 - 5,000***) Oh look, there's one in state, it's kind of exciting!

With the Counselor in her second search, she ended up changing her selection factors. She looked at slightly larger schools, reporting that she had talked to some family members and friends and thought she could handle a slightly larger college. She also looked at private schools in the smaller size after the counselor explained to her that frequently smaller colleges are private. She changed her mind when she was alone out of frustration of having no choices, but with the counselor she changed her mind because of increased understanding about the factors involved.

PROBLEM SOLVING STRATEGIES

The students were simultaneously trying to solve two problems if they conducted their first search alone. They were trying to learn how the program itself worked as well as trying to decide on the various pathway criteria and factors relevant to their college choices. With the counselor, they only had to worry about the second of those problems. The counselor introduced the students to the way the program itself worked, and then went beyond that to suggest some strategies for how to get what they wanted with the search program. The two counselors utilized two different strategies. Students were satisfied with and responded to both of them equally positively.

June

June asked the students to start with the pathway criteria which was considered most important, then proceeded to the next most important, etc. Along the way, if a selection factor significantly limited the number of colleges on the list, she would suggest printing that list and then removing that selection factor. The students retained the lists of colleges that corresponded to each of their selections, and they would look at these for overlap names indicating colleges that met many or most of the particular selection factors input.

> Counselor: So, lets start with what are some of the most important things to you? Size, location, major? - what would you say is one of the most important things to you about looking at college?
> Marie: Um, location.
> Counselor: Okay, let's go into location.
> Marie: Okay.
> Counselor: Go into College Character, and what location do you have in mind? (Student takes mouse and clicks on college character, location)
> Marie: In ***MICHIGAN*** (selects Michigan)

Counselor: Tell me about that.....(discusses why the student is wanting to look at colleges in Michigan)
That may be worth printing just to save it. Print pool with criteria, that is going to give you that list. Now you can click ***ENVIRONMENTAL BIOLOGY*** off, and go and look for some other areas, but you will still have that information.
Marie: Okay
Counselor: Okay, lets scroll down a bit and see, let's enter physical sciences. There we go, ***ENVIRONMENTAL SCIENCE***. Thirteen, that's a good list. That would be worth printing too, now let's compare these lists and see who might have both.

Another student was introduced to the strategy in a similar way:

Jean: I have gone back and forth between intramural and intercollegiate. I, the thing is I would have to go to the school and see if they would want me, for water polo or swimming, water polo seems more likely, but I think like University intercollegiate program looks really good, but I don't know if I could play at that level.
Counselor: Well, maybe if you put it in, so we know if they had it, (selects ***WATER POLO***)... That narrows it down a great deal (4) Let's print that list right now, just so you know who the 4 are that have it. Now click it off and see who has ***SWIMMING AND DIVING***. Sometimes I print a lot of stuff, even though it might not be the answer, just so you don't have to go back in and re-create it. Now you are going to see who has swimming, who those ninety one are..... OK, did you have both ***WOMEN'S STUDIES*** and ***PSYCHOLOGY*** checked?
Jean: Yea, I have both, it doesn't change if I add the second one.
Counselor: That's because its an OR, what would happen if you took off the ***PSYCHOLOGY*** and just have ***WOMEN'S STUDIES***, you're only going to get 27
Jean: OOOOHHH,
Counselor: So you might print that list so you know who has women's studies, 27 is a number that's pretty manageable.

Marie, in her interview after both searches reflected: "I really liked the idea of being able to go in and make one option, see what the results were and then back out of that option and put in another one. Now I am going to go home and compare these lists....The first time I did the search I felt that if this option is here, I should probably make a choice and wanted to click every button. This time there was more structure and

planning." As she talked about this, she held onto the three printed lists from the With Counselor search and occasionally looked through them as we talked. After her first, Alone search, she had only wanted a copy of one of her five generated lists.

Jean reflected on this strategy in the following way. "Most of the basic factors we looked at ended up being the same in both searches, but it was so much more organized the way she showed me to go through it, putting in something, printing that list and then taking it out so that I could look at something else and the compare the lists and look for common schools. The first time (Alone) I felt overwhelmed in the process and kind of got lost with the different things I put in and took out and had with the ANY or ALL. Her process of printing it and the going in and adding or deleting other things kept me on track, I did not feel lost because I knew it was printed so I did not have to remember it"

Alan

The other counselor's approach was to introduce the student to all of the pathway criteria, explaining each briefly, asking the student if that was an area he or she wanted to include as a selection factor. When the factors were ranges of information rather than exclusive factors, he would make selections on the screen which would allow the students to see where the colleges fell in the ranges presented in these pathways. For example, he would select the tuition and fees ***LESS THAN $1000*** to see what colleges in the student's pool would show up in that list, then deselect that and select the next level up, ***LESS THAN $3500*** etc. This philosophy is similar to June's but Alan did not print these lists and used it only in the pathways with ranges, namely the tuition and fees pathway and the difficulty level pathway (selection factors here are ***MOST, VERY, MODERATELY***, and ***MINIMALLY DIFFICULT***, and ***NON-COMPETITIVE***).

Alan introduced students to the student body size part of the program and process in the following way:

> Counselor: What campuses have you been on? You have been on a lot, I know. You have been to Liberal Arts College for tennis, right? That would be in the small category.
> Mary: Yes, and I have been to State, that's too big.
> Counselor: Okay, so you know what a big school feels like.
> Mary: Yea.
> Counselor: I am just trying to see, in your mind's eye, can you visualize some of these sizes? This would be the State size (points the mouse arrow at the ***>20,000*** selection factor). Liberal Arts College may be this size right here, it is actually on the smaller side of this (points the mouse arrow at the ***1,000 - 2,499*** selection factor). What are some of the other colleges you have been to?
> Mary: City University.
> Counselor: All right, they are probably in this range, maybe this range but I don't think so. (points the mouse arrow at the ***5,000 - 9,999***, wavers momentarily above the ***10,000 to 20,000*** and returns it to the ***5,000 - 9,999***).
> Mary: Yes, I think it is probably medium.
> Counselor: Medium, maybe a little larger than medium. Okay, so you know what that means when you say large. What feels good to you when you saw some of those?
> Mary: Medium is good for me.
> Counselor: Okay, so in the ***5,000 - 10,000*** range, Any more? (selects 5-10,000).
> Mary: Um, I don't know.
> Counselor: Okay, and that is fine. For today's search we will do that. One of the things I will tell you is that often if a school does not come up on your list, sometimes it may be that it has 10,040 and to you it may not make a big difference, only here it would be cut. Or it might be 4888 and it would still be out of bounds. So we need to keep an eye on that. ...You should know that you can review your selections so if you are starting to feel too confined we can go back and change something we did before.

Students also reported a high level of comfort with the strategy of selecting ranges, seeing which colleges were in each range but retaining the whole list. They used this strategy themselves when they did a second search. Before being taught this strategy,

they had not thought of how to check the impact of the range by looking at them one at a time.

Alone

The strategies which the counselor introduced were overwhelmingly appreciated by the students. On their own, the strategies which the students followed tended to be either more experimental or more focused on ensuring that a specific college would end up on the list. In addition, the above quote from Marie about her Alone process indicated that she felt she should make a choice in each pathway presented.

For example, when Lynn had zero colleges in her pool she knew she wanted to deselect one selection factor but could not remember where it was: "I am so lost it isn't even funny, brbrbrbrbrbr.....I am just going to click a bunch of buttons until I find something." Lynn seemed particularly frustrated, so I asked her if she would stay at the computer if she were not part of this study. "Maybe not, it would depend on how lost I got after I clicked my buttons"

Michael hesitated at the Setting screen with the selection factors of ***URBAN, SUBURBAN, EASY ACCESS TO METROPOLITAN AREA, SMALL TOWN***, and ***RURAL***. "Um, I am kind of deciding whether I want, whether the college I want to go to is suburban or easy access or small town."

Roger, in his interview after the second search admitted that his confidence level with the first search was based on the fact that two schools he was interested in were in his pool.

An interesting aspect about this is that experimentation, which is frequently not considered a positive problem solving strategy when counselors are working with

students on questions of choices to make such as drugs, violence, etc. , is actually a very viable strategy when working in a computer program such as this. Frequently during their Alone search, the student would verbalize a question such as "Can I click on two of these at the same time?" or "Will this get me there?" while they were actively selecting factors or criteria. They were able to answer their own questions only because of their willingness to experiment with the options on the screen. As we think about teaching problem solving strategies to students in the future, we may have to adapt how we refer to experimentation as a strategy.

Lessons learned

The students who conducted their first search With the Counselor and then their Alone search used the problem solving strategies the counselors had shown them. None of the students printed lists as June presented. However, the students who had been most involved with that were in their second search, so if they were to conduct a third search they might use that strategy. The students who had conducted their first search with June still tended to start in the upper left corner, but after that would follow by priority. The students who had conducted their search with Alan tended to go through the pathways in order of presentation on the screen. After working with the counselor, the students were more aware of watching the impact of selection factors on the number of colleges in their pool. They checked the ranges separately in order to compare the finances and difficulty level. They were better able to comprehend the AND/OR option and use the WHY NOT option to their advantage.

When I interviewed the counselors after the study was completed, they indicated they were considering offering a class to introduce and teach the students how to use the

program once, and then let them use it on their own. I believe that this would be beneficial to the students, and fit the standards of practice as prescribed by the American School Counselor Association. On an individual basis, the students learned a lot about how to use the program. They used these lessons and applied the strategies to different factors in their next search. I would predict that a group lesson would produce similar results.

COUNSELOR/STUDENT INTERACTION

I told you so

Even in the best of situations, and frequently without our awareness, counselors might say something which is more directive than what would be considered ideal. In this situation, when the counselor is more knowledgeable about the program as well as about many specifics about colleges and this process, there is even more opportunity for counselors to insert their own values or interpretations into the interaction.

In one situation, for example, Judy indicated that she wanted to start her search with "area". The counselor interpreted this to mean geographic area, and directed the student which pathway to follow to find geographic areas. Actually, Judy might have had area of study in mind.

More often, though, the statements that might be considered value laden were ones that directed a student to consider a certain pathway next, the importance of a choice in a particular area, or a recommendation on when to stop the search. For example, with Ann, as the counselor was explaining the options in the COLLEGE CHARACTER pathway, he said "I think this can be kind of important" as they started

looking at the SIZE selection factors. Later when they were looking at MAJORS, he asked "Are you an undecided kid like most people on earth, or...?" These remarks could have led Ann to believe that his expectations were the norm, and if she did not care about size or was decided on a major, she might not have felt comfortable saying so.

Marie, during her search, wanted to look at the options in CAMPUS LIFE. Her counselor responded that "Some of those might not be important, but may be things you think about once you narrow it down in other areas. How about a major? Do you have a couple ideas?"

Judy talked with the counselor about the impact of choosing a small school versus a large school. The counselor asked and concurred with Judy's belief that she would have the assertiveness to approach a professor after class or during office hours, something with which some students would not feel comfortable. When I asked Judy about this question though, the issue of size for her was one of percentage of students she would know as a comfort level on campus. In this situation, because the counselor did not check on the meaning of the factor assigned by the student, she missed an important issue.

One of the questions I asked students after their search with the counselor was how much control they believed they retained. Most students indicated that they felt the control was very even, either 50/50 or 60/40 with the student more in control than the counselor. During some of the searches, the counselor had the mouse, but this did not seem to define control. The students reflected on this question in the following ways. Roger said that the control was 50/50, that he communicated his wishes to the counselor, who helped him think through the process, and noted that the mutual process was very

positive. Jean said that in one way the counselor was more in control because of the suggestions made by the counselor, but that Jean had the mouse so she was in control of that and decided in what order to put things into the search or whether to accept the counselor's suggestions. She saw the control as about even. Lynn indicated that she felt the control was shared, that she was contributing primarily information about herself and what she wanted, and that the counselor was contributing her knowledge about the computer program and colleges.

Many of our interactions are sprinkled with comments which show a bias or value, and I believe even the most well-intentioned counselor occasionally slips from a goal of being student-centered. Interaction with the computer search program is no exception, and we need to continue to be careful with our communication in these settings.

It's a personal thing

Even though the computer is an impersonal machine on which much attention is focused during the process of a college search, there were many instances in which very personal talk occurred between the students and counselors. There may have been even more if I had not been in the room, although I never had the sense that the students were uncomfortable with this. Alan, who sometimes did not know the students since he is not their counselor, entered into personal talk at almost the same rate as June, who knew the students quite well.

Many of the personal discussions revolved around family issues. Some of these were stories of older siblings' decisions. Some involved divorced parents and how both the accompanying geographical and emotional pulls impact a student's decision. Some

involved the feelings about leaving home in general, or about pressure the student was experiencing about the college selection process. Some involved the financial impact of college attendance.

Another common theme was more academic. Some involved experiences a student had which led to a focus on a particular major. Some involved the student's level of confidence as it affected a choice. Some involved sharing experiences and choices from the counselor's life. Some involved self-awareness, agreements or differences in how the students saw themselves as compared to how the counselors saw them in reference to choices.

Occasionally I noticed that at times of personal talk, the student took his or her hand off the mouse, though not consistently. I did not notice this until rather late in the process, and since I did not video tape the searches I could not go back and look for that as a pattern.

Don't Worry, Be Happy

I have yet to meet a student who has absolutely no concerns about entering the college selection and decision making process. Certainly some are more stressed than others, but there is always some level of anxiety. Both counselors were able to alleviate the stress level that the student experienced. The families of Suburbia High school meet with the counselor for an hour-long Junior conference to discuss the college selection process. Ten of the students had their Junior conference prior to conducting these searches. Even with this level of support, many of the students had a high level of anxiety about entering the process. Two students thanked me specifically for asking them to be in the study because they said they would never have come in and utilized the

computer program otherwise. They indicated that this push to start had helped them get over their intimidation of the procedure. Many students referred to appreciating the computer program as an avenue to make sense of all the information that is available about colleges. Usually when the students talked about this, their eyes got big and they would wave their hands around the room with all of the full book cases and refer to the amount of information as overwhelming.

The counselor eased the tension in a number of ways. One was introducing a method to the process, as reported earlier. Also, much more directly, the counselors referred to the difficulty that students face in this process. Lynn, the student who experienced the highest level of frustration in her first search when she kept getting Zero colleges on her list, relaxed visibly and smiled when she was told by her counselor:

> Let's think in terms of we are going to gather information, we are not going to try to make a decision, or plan your life. We're just going to look for information. Who has environmental studies? Who has education? Who has something related to philosophy or religious studies or youth leadership? And then let's see where they overlap. It's hard, I think, to think in terms of - I gotta decide what I am going to do for the rest of my life. I think that really puts a lot of pressure on you. That's the reason it gets so confusing and stressful. So let's just think of this as a tool, like we are going to the library to look something up.

The counselors also let the students know that they could save their information and/or come back to conduct another search or change some of the selection factors if they changed their minds. "Kind of good to know because if you come back and sit down another time, it is easy for you to just go right ahead and select your criteria, and you can get back to the same place, or if you are saying to yourself, you know some of this might change. I have been on a campus that is smaller and that was okay, or I want

to knock something else out, or add these more states in, or whatever". This also helped alleviate the students' stress because they were assured it is acceptable to change their minds.

Lynn told me in her second interview that she was looking forward to the process of looking at colleges after her second search, whereas she had been depressed and negative after her first search. Marie said she was excited. Roger also reflected on initially being intimidated by the entire college resource room but now felt confident and comfortable and ready to move on.

INTERPRETATION OF SELECTION FACTORS

Validity

As reported in the reviewed literature, the students in this study also seemed to be unwilling to question the veracity of information included in the search options. When I asked one student directly about this, she said that since it is updated regularly that this meant that the information would be valid.

Other students noticed things which were not consistent with other information they had received. One student questioned whether a college a friend attended really had a listed sports team, and another noted that the listed requirements for admission were not consistent with what the counselor had recommended for college admission. Both students were aware of inconsistencies with other information but were more willing to believe the computer program as a source and did not mention the possibility of checking in any other resource.

Relying on any one source for information is fraught with difficulties. The data in these programs are surveys in an admission office, and transferred to the computer company. Any one source of information has possible flaws. Students, and probably counselors, need to be reminded that information from a computer is not automatically factual.

Diversity

I was pleased to see that quite a few of the students from almost-all-white Suburbia were aware that their experience was sheltered and wanted information about the diversity on campus. The pathway to find this information is COLLEGE CHARACTER > STUDENT BODY > STUDENT MIX. The selection factors are:

MORE THAN 10% AFRICAN AMERICAN,

MORE THAN 35% AFRICAN AMERICAN,

MORE THAN 5% ASIAN,

MORE THAN 5% HISPANIC,

MORE THAN 5% INTERNATIONAL STUDENTS,

and some options regarding transfer, older than age 25, part time and full time percentage of enrollment. This was one of the selections where the student could also indicate ANY or ALL.

Even though the students wanted diversity, they were unwilling to select one of these options. As Jean indicated "It is important to have a mix, but I can't really put my finger on a percent". The counselor explained her philosophy to Julie. "Usually where this becomes most important is if you are African American, or Asian or Hispanic, and you want to make sure there are other people of like culture. I think at most of the public

universities you are going to get a mix. It's too bad they don't have a way of defining that a little differently". As she was saying this, she was experimenting with various combinations of the selection factors. Zero colleges were left in the in-state pool when ALL was selected with MORE THAN 10% AFRICAN AMERICAN, and 5% ASIAN and 5% HISPANIC. Twenty two remained when this was switched to ANY, which would include any college with either more than 5% HISPANICS or more than 5% ASIANS or more than 10% AFRICAN AMERICANS. The counselor did not look through this list of names, but was not correct in her assumption that the public universities would have a mix. In fact, one of the small colleges that Julie reported dropped from consideration was one of the twenty two. Furthermore, one of the large public schools she was considering was not on the list. I mentioned this to her in our interview after her second search, and showed her a list of schools I had generated out of curiosity. She was surprised and said that she would probably look again at the small college included on the list.

Students, both minority and majority, want diversity for a variety of good reasons. We need to provide them with information in a form which allows them to use it for their own reasons.

FITTING INTO THE BIGGER PICTURE OF THE PROCESS

Unknown names - What? Who? Where?

One of the inherent benefits of a computer college search is that it will include names of colleges that the student has not heard of before, yet the student knows that these colleges meet the criteria in which the student is interested. The student is not at

the mercy of how much (or how little) his parents, friends, teachers, or counselors know. As a counselor, I have frequently struggled to help students look beyond the very few colleges whose names are recognized around the world. Every counselor I know has tales of this sort. Being able to hold up a printed list and show the student that some colleges he or she may not have heard of satisfy the same criteria, and possibly are on the same list as some of those colleges they do recognize, should be beneficial to colleges who are not as well known. I know that colleges frequently ask students where they learned about their college. I would be very interested in learning whether any trends have developed in terms of students learning about some colleges through these searches.

The students in this study tended to not look further at colleges if they did not recognize the name. A stark exception to this was one student who specifically looked at profile information on colleges she had not heard of before. One student looked for particular city names where the colleges were located and was willing to look at unfamiliar colleges in a city she preferred. Another student indicated a few times that she knew a college because she had received mail from them, so the name was recognizable to her. All the other students reported that they were not likely to look further at colleges with which they were not yet familiar. Many of them said this with some sheepishness and admitted that they should be more open-minded. Lynn equated this issue with one of size, which is not necessarily the same, but her sentiments are representative. She said after her first, Alone, search: "I don't know, I don't want to go to a big college but I don't want to go to any of these colleges that I have never heard of, which doesn't make sense, because you aren't going to hear about little colleges, maybe I just need to get over my fear of large amounts of people". Interestingly, after her second

search. With the Counselor, she seemed anxious to research all the colleges on her list, even unfamiliar ones. When I asked her what she thought the difference was, she said she believed that she had been able to remain truer to her priorities. Not only did this increase her confidence in the search, she felt that these unfamiliar colleges were more "friendly" than the ones on her first list.

The one area in which students reported they would like more support was in evaluating the colleges that were generated on the list. The two counselors in this study both are opposed to the idea of actually selecting a college FOR the student, they see their role as facilitators to find information but not to pick a school. Their general practice, therefore, is to not talk about their knowledge of particular colleges since this could be interpreted as preferential. Both asked the students on occasion whether any of the colleges on the lists were of interest to the students. When I asked the students about these situations, they reported feeling awkward because many did not know how to respond to these unfamiliar names, but did not want to appear naive to the counselor.

While I understand the sentiments and dilemmas presented by the idea of counselors recommending particular colleges, I think this is an issue that counselors need to balance. Students certainly need to do the follow-up research on their own. I have talked with many counselors who end up feeling that students want us to do all their work for them. This is against all of our principles of teaching responsibility and decision making. On the other hand, if we know that the students are not likely to look any further at some colleges, and that they are more likely to do more research if we mention a background knowledge of that college, then we are using our knowledge and influence to help the students broaden their horizons. In the few situations when a name

appeared on a list and the counselor did mention that he or she had been on that campus or knew students who attended there, this increased the student comfort with those colleges. With Roger, who conducted his second search Alone and ended up with a broader list during this search because he had heeded the counselor's concern about narrowing his options too quickly, he looked at two college profiles in particular from his new list. After our interview, I told him that if I had been in a position to say so at the time of his search those would be the two colleges I was most familiar with and believed that he would do well on either campus. He expressed his appreciation for that input and said that made him even more certain about continuing to look at those colleges. In this way, I just verified his instincts without interfering with the process. For counselors who might be hesitant to make recommendations, this may end up being a happy medium.

Role Playing

One of the questions I asked the students after each search was what they saw as the role of the counselor, the role of the computer, and their own role. Overwhelmingly, the role of the computer was to make sense of the massive amount of information available about colleges and to provide a list of colleges that satisfy their criteria to help them get started in the process. This did not change with the methodology of the search. Their own role also did not change. They indicated that they needed to be self-aware, that they needed to be making decisions, and that they needed to conduct further research.

There was a shift in how the students talked about the role of the counselor. After the Alone searches, the students made references to counselors guiding them through the process, answering questions, writing recommendations and helping a student be

realistic. After the With Counselor search, however, they referred to the counselor role as helping them organize thoughts, priorities and options. They also reflected on the advantage of being able to integrate the counselor's knowledge about themselves personally with the computer program. One student specifically said that the counselor helps him make the best decision possible, which had not been reflected in the earlier search. Another student reflected on an awareness that his initial intimidation of the process included some fear and concerns about moving on and out of high school. He saw the support that the counselor had given him as also helping him get over these fears. These shifts in the way the student views the counselor role are, I believe, all for the positive and are consistent with the role as counselors would perceive it.

More to do

Students saw both of the searches conducted as one part of the college selection process. The students reflected on knowing that the computer search was not producing their final list of colleges to which to apply. As June explained to one student:

> What is usually helpful, is after you print out the profiles, take a look at them, maybe go to the file, see what's in the file on any of those schools, then maybe use the video, use the college catalog, what ever it is. But it helps you narrow down, first narrow down your info that you have, and then start thinking about - gosh, does this college sound like it fits? Does it sound like my GPA, my test scores, you know kind of looking at all those areas. Housing, that kind of thing. What other kind of activities - are there things that you think you want to continue doing that you have done in high school?

Another student attested that she was pretty sure that she would research some of the colleges on this list but that she was not done looking, and wanted to return to look at some other geographic areas. Alan introduced the program to one student with the following words: "...make sure you know how to use the program, and then you can come

back and do it again, and go home with some ideas, come and answer some questions, that kind of thing".

Both counselors were consistently recommending further research, discussions with parents especially about finances and distances, continuing to gain additional information both about colleges and about themselves that might change the focus of a search, and allowing for the idea that the computer search program does not necessarily produce a final list. Again, this is consistent with counselor goals of students being actively involved in the decision making, keeping their minds open to new information and options, and continually reevaluating their decisions.

Discussion

There are some obvious limitations to this study. This study was conducted in one suburban school, with two counselors. The students had similar backgrounds in terms of their academic exposure to college preparatory expectations which might not be typical of students across the country. The two counselors in the study both are very comfortable and confident in their knowledge and use of the computer program. This also might not be typical of counselors across the country.

Additional questions which arose from this study include the impact of a 'practice effect' of a student conducting two or more searches and how much they would eventually figure out for themselves. It would also be interesting to learn what the current practices are in school counseling offices regarding the usage of these computer programs. At this point I have only limited anecdotal background on whether students use the programs alone, with a counselor, or have training sessions offered. I doubt, but

do not know, that students experience equality of access to these programs in our schools. Additional information could be gained by conducting a similar study both in a variety of schools, and by videotaping the search process rather than audio taping it.

I do believe that there is a qualitative difference in a student's experience when using the computer search program independently and with the support of a counselor. These programs are frequently advertised as 'intuitive', yet aspects to the program caused the students difficulty. Even these students, who were self-reportedly very comfortable with using computers, did not have the understanding and problem-solving approach to utilize all the options in the program. I think that we (meaning adults who did not grow up with computers in our schools and homes) see that our students, who frequently did grow up with this exposure, have a higher comfort level with computers than we have. From this we assume that today's students have a thorough understanding of how a computer program works. Indeed, they are probably more comfortable with going into a program and experimenting with the confidence that they will be able to figure it out than we are likely to be. However, one of the things that became clear to me during this study is that comfort with computers does not equate with understanding and problem solving. Our students need to be taught how to use sophisticated search programs, including Boolean logic. If we expect them to be able to use this in the counseling office, then either we need to be able to teach it or we need to make sure that it is taught elsewhere in the curriculum.

Furthermore, I believe that we may need to examine our philosophies of college counseling and make some conscientious decisions regarding some of the issues brought up by this study. One would be an awareness of the differences that each available

program will bring to our office, thereby carefully making a decision as to which of these programs to purchase. Another would be inclusion of teaching the process and potential pitfalls to the student who are using the programs. I cannot advocate that each student search be conducted with the support of a counselor, because I am keenly aware of the time involved in this and the time pressures that the rest of our job presents. However, I would advocate either a training session for office aides, a class presentation, or some avenue of teaching the students some of the intricacies and special options presented in the program purchased. Some counselors I know assume that just having a program available takes care of the search process, and I no longer believe this is a viable assumption.

Another area of philosophy which needs to be addressed is the issue of helping students sort through the lists they generate. This is already an issue that most counselors have thought about, but this study shows that students might be conducting their search with the goal of having a specific college on their list, and that they are not likely to research colleges that they are not familiar with. In this case, conducting a computer search serves no real purpose. We may need to rethink how we approach suggesting a search and utilizing the results to encourage students to learn as much as possible from the procedure.

Moreover, few counselor preparation programs have courses either in college counseling or in utilizing technology in a counseling setting. Since technology is definitely the trend of the future, I believe our education of school counselors will need to be shifted to incorporate this. I believe that the computer, though non-personal, can be a helpful tool in a personal process, but that this needs to be taught as a counseling

resource. With 92% of high school counselors reporting college counseling as one of their four most time consuming duties, I think we need to address this in our counselor preparation programs as well.

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Table 1

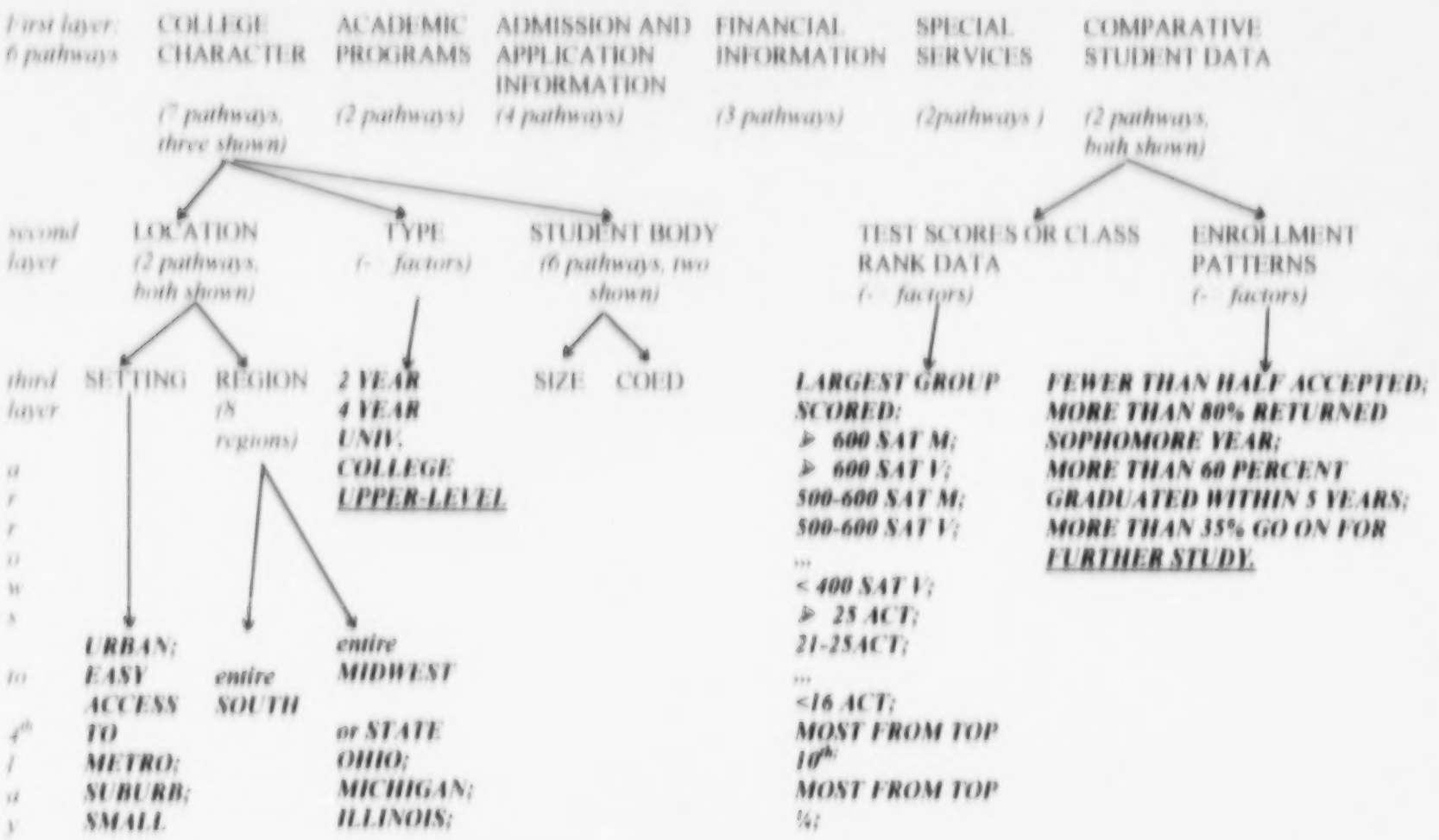
first layer: 6 pathways
COLLEGE CHARACTER
(7 pathways, three shown)
ACADEMIC PROGRAMS
(2 pathways)
ADMISSION AND APPLICATION INFORMATION
(4 pathways)
FINANCIAL INFORMATION
(3 pathways)
SPECIAL SERVICES
(2pathways)
COMPARATIVE STUDENT DATA
(2 pathways, both shown)
second layer
LOCATION
(2 pathways, both shown)
TYPE
(- factors)
STUDENT BODY
(6 pathways, two shown)
TEST SCORES OR CLASS RANK DATA
(- factors)
ENROLLMENT PATTERNS
(- factors)
third layer
SETTING
REGION
(8 regions)
2 YEAR
4 YEAR
UNIV;
COLLEGE
UPPER-LEVEL
SIZE
COED
LARGEST GROUP SCORED:
600 SAT M;
600 SAT V;
500-600 SAT M;
500-600 SAT V;
...
< 400 SAT V;
25 ACT;
21-25ACT;
...
<16 ACT;
MOST FROM TOP 10%;
MOST FROM TOP ¼;
FEWER THAN HALF ACCEPTED;
MORE THAN 80% RETURNED SOPHOMORE YEAR;
MORE THAN 60 PERCENT GRADUATED WITHIN 5 YEARS;
MORE THAN 35% GO ON FOR FURTHER STUDY.
URBAN;
EASY ACCESS TO METRO;
SUBURB;
SMALL
entire SOUTH
entire MIDWEST
or STATE
OHIO;
MICHIGAN;
ILLINOIS;

Table 2

FACTORS SELECTED

STUDENTS ALONE	WITH COUNSELOR
ONE THIRD included a selection factor of Urban, Suburban, Easy Access to Metropolitan Area, Small Town or Rural.	ONE STUDENT included one of these factors.
ONE FOURTH included a selection factor of either Public, Private, or Religiously Affiliated.	NO STUDENTS included any of these factors in their search.
ONE FOURTH included a selection factor of wanting fraternities or sororities on campus.	NO STUDENTS included this factor in their search.
ONE HALF of the students selected College Housing Available, Off-Campus Living Allowed.	ONE STUDENT included this factor in their search.
ONE THIRD of the students selected options of sports availability at either the intramural or interscholastic level.	ONE STUDENT included this factor in their search

Appendix

To be completed before the start of the research process

Demographic survey for participant students

Gender: M F GPA:_____ Date of birth: _____

Anticipated/Actual SAT M_____ V_____ ACT ____ (If you have not taken the tests yet, use the predictions from the PLAN and/or PSAT)

Please check the statement that reflects best your comfort level with computer use:

_____I am comfortable with word processing and/or games only

_____I am comfortable with word processing and Internet access

_____I am comfortable with word processing, Internet access and writing programs

_____ I am not very comfortable using a computer

_____None of the above statements reflect my proficiency with computers, I would characterize it as follows: _____

The highest educational level attained by my father is: (circle one)

High School Community College Bachelor's Degree Masters Degree

Doctorate or Specialist beyond College

Name of college(s) attended: _____

My father's profession and job title: _____

The highest educational level attained by my mother is: (circle one)

High School Community College Bachelor's Degree Masters Degree

Doctorate or Specialist beyond College

Name of college(s) attended: _____

My mother's profession and job title: _____

Do you have older siblings who are currently attending or attended college? Please list their gender, their age and the college(s) attended:

_____

_____

Are you aware of whether any of your siblings used computer searches? Please describe your knowledge of this: _____

Appendix

Pre-Questionnaire Continued

Have you conducted a computer college search before? YES NO

If yes, Please describe how the search was made available to you and what your recollections are about the process.

Have you attended a Junior conference with your counselor to discuss college plans?
YES NO

Using the following scale, rate your beliefs about the following statements:
SA= Agree strongly, A= Agree, N= Neutral D=Disagree, SD=Strongly Disagree

I have a specific college in mind that I want to be the result of my search

SA A N D SD

I am very certain of the priorities I want to consider in my search

SA A N D SD

I am open to any possibilities that are recommended to me

SA A N D SD

I have confidence in my college counselor

SA A N D SD

I believe that my counselor knows me well enough to provide guidance

SA A N D SD

I believe that my counselor will play a significant role in helping me with my college selection.

SA A N D SD